


***RENEWAL OF THE ENVIRONMENTAL
CLEARANCE FOR THE SAND AND
AGGREGATE MINING OPERATIONS IN
THE SEËIS RIVER ON THE REMAINDER
OF FARM EXCELSIOR No. 286,
WINDHOEK, KHOMAS REGION***

September 2021

App - 002949

Project Name:	<p align="center">RENEWAL OF THE ENVIRONMENTAL CLEARANCE FOR SAND AND AGGREGATE MINING OPERATIONS IN THE SEËIS RIVER ON THE REMAINDER OF FARM EXCELSIOR No. 286, WINDHOEK, KHOMAS REGION</p>
The Proponent:	<p align="center">Sandworx CC PO Box 11588 WINDHOEK</p>
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EXECUTIVE SUMMARY

Green Earth Environmental Consultants were appointed by the proponent, Sandworx CC, to conduct an environmental impact assessment renewal for the sand and aggregate mining operations in the Seëis River on the Remainder of Farm Excelsior No. 286, Windhoek, Khomas Region.

The proposed land where the mining activities is taking place is currently disturbed and human interference is visible. The project site is surrounded by predominately open areas with farming related activities with associated infrastructure.

An Environmental Clearance Certificate (ECC) for the proposed activity was obtained 26 October 2018 therefore the Clearance Certificate will expire on 26 October 2021. To be able to continue with the sand mining activities, the ECC must be renewed.

In accordance with the Environmental Impact Assessment Regulations (GN 30 in GG 4878 of 6 February 2012) of the Environmental Management Act (No. 7 of 2007), the activities listed below, which forms part of the proposed operations, may not be undertaken without a renewed Environmental Clearance:

MINING AND QUARRYING ACTIVITIES

- *The construction of facilities for any process or activities which requires a licence, right or other form of authorisation, and the renewal of a licence, right or other form of authorisation, in terms of the Minerals (Prospecting and Mining Act), 1992.*
- *Other forms of mining or extraction of any natural resources whether regulated by law or not.*
- *Resource extraction, manipulation, conservation and related activities.*

The key characteristics/environmental impacts of the proposed project are as follows:

POSITIVE IMPACTS	NEGATIVE IMPACTS
Value will still be added to sand and stone that will be mined.	Natural surface drainage systems and channels might be lost.
Sand and stone will still be made available to building contractors. Currently there is a need for sand and stone in Windhoek and the surroundings.	There is an increase in traffic in the operational phase due to transporting vehicles.
Temporary and permanent employment will continue in the operational phase.	Dust and noise might be generated during the operations.
The buying power of locals might also increase due to more individuals being employed.	Transmission of diseases from people or to people involved in operations might take place.

The environmental impacts during the operational phase of the proposed project:

IMPACTS DURING OPERATIONAL PHASE			
Aspect	Impact Type	Significance of impacts Unmitigated	Significance of impacts Mitigated
Ecology Impacts	-	M	L
Dust and Air Quality	-	M	L
Groundwater Contamination	-	M	L
Waste Generation	-	M	L
Failure of Reticulation Pipeline	-	L	L
Fires and Explosions	-	M	L
Safety and Security	-	L	L

IMPACT EVALUATION CRITERION (DEAT 2006):		
Criteria	Rating (Severity)	
Impact Type	+	Positive
	O	No Impact
	-	Negative
Significance of impacts	L	Low (Little or no impact)
	M	Medium (Manageable impacts)
	H	High (Adverse impact)

The type of activities that is carried out on the site will not negatively affect the amenity of the locality and the activities will not adversely affect the environmental quality of the area. None of the potential impacts identified are regarded as having a significant impact to the extent that the proposed project should not be allowed. However, the operational activities further on need to be controlled and monitored by the assigned managers and the proponent. Mitigation measures will be provided that can control the extent, intensity, and frequency of these named impacts in order not to have substantial negative effects or results. It is believed that the overall cumulative impact on the biophysical environment will be low and there will be a positive impact on the socio-economic environment.

The Environmental Impact Assessment Renewal which follows upon this paragraph was conducted in accordance with the guidelines and stipulations of the Environmental Management Act (No 7 of 2007) meaning that all possible impacts have been considered and the details are presented in the report.

Based upon the conclusions and recommendations of the renewed Environmental Impact Assessment Report and Environmental Management Plan, the Environmental Commissioner of the Ministry of Environment, Forestry and Tourism is herewith requested to:

1. Accept and approve the Environmental Impact Assessment Renewal.
2. Accept and approve the renewed Environmental Management Plan.

3. Issue an Environmental Clearance Renewal for the sand and aggregate mining operations in the Seëis River on the Remainder of Farm Excelsior No. 286, Windhoek, Khomas Region and for the following listed activities:

MINING AND QUARRYING ACTIVITIES

- *The construction of facilities for any process or activities which requires a licence, right or other form of authorisation, and the renewal of a licence, right or other form of authorisation, in terms of the Minerals (Prospecting and Mining Act), 1992.*
- *Other forms of mining or extraction of any natural resources whether regulated by law or not.*
- *Resource extraction, manipulation, conservation and related activities.*

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LIST OF ABBREVIATIONS

EC	Environmental Clearance
ECO	Environment Control Officer
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
I&APs	Interested and Affected Parties
MAWLR	Ministry of Agriculture, Water and Land Reform
MEFT	Ministry of Environment, Forestry and Tourism

1. INTRODUCTION

Green Earth Environmental Consultants were appointed by the proponent, Sandworx CC, to conduct an environmental impact assessment renewal for the intended sand mining operations with stone aggregate as by product in a section of the Seeis River, which is located on Farm Excelsior, Khomas Region.

In accordance with the Environmental Impact Assessment Regulations (GN 30 in GG 4878 of 6 February 2012) of the Environmental Management Act (No. 7 of 2007), the activities listed below, which forms part of the proposed operations, may not be undertaken without an Environmental Clearance:

MINING AND QUARRYING ACTIVITIES

- *The construction of facilities for any process or activities which requires a licence, right or other form of authorisation, and the renewal of a licence, right or other form of authorisation, in terms of the Minerals (Prospecting and Mining Act), 1992.*
- *Other forms of mining or extraction of any natural resources whether regulated by law or not.*
- *Resource extraction, manipulation, conservation and related activities.*

The current Environmental Clearance Certificate was issued on 26 October 2018 and will expire on 26 October 2021. The following Environmental Impact Assessment Renewal contains information on the project and the surrounding areas and activities.

2. TERMS OF REFERENCE

To be able to implement the project, a renewed Environmental Impact Assessment and Environmental Clearance is required. For this environmental impact exercise, *Green Earth Environmental Consultants* followed the terms of reference as stipulated under the Environmental Management Act.

The aim of the environmental impact assessment is:

- To comply with Namibia's Environmental Management Act (2007) and its regulations (2012).
- To ascertain existing environmental conditions on the site to determine its environmental sensitivity.
- To inform I&APs and relevant authorities of the details of the proposed activities and to provide them with an opportunity to raise issues and concerns.
- To assess the significance of issues and concerns raised.
- To compile a report detailing all identified issues and possible impacts, stipulating the way forward and identify specialist investigations required.
- To outline management guidelines in an Environmental Management Plan (EMP) to minimize and/or mitigate potentially negative impacts.

The tasks that were undertaken for the Environmental Impact Assessment Renewal included the evaluation of the following: climate, water (hydrology), vegetation, geology,

soils, social, cultural heritage, groundwater, sedimentation, erosion, biodiversity, sense of place, socio-economic environment, health, safety and traffic.

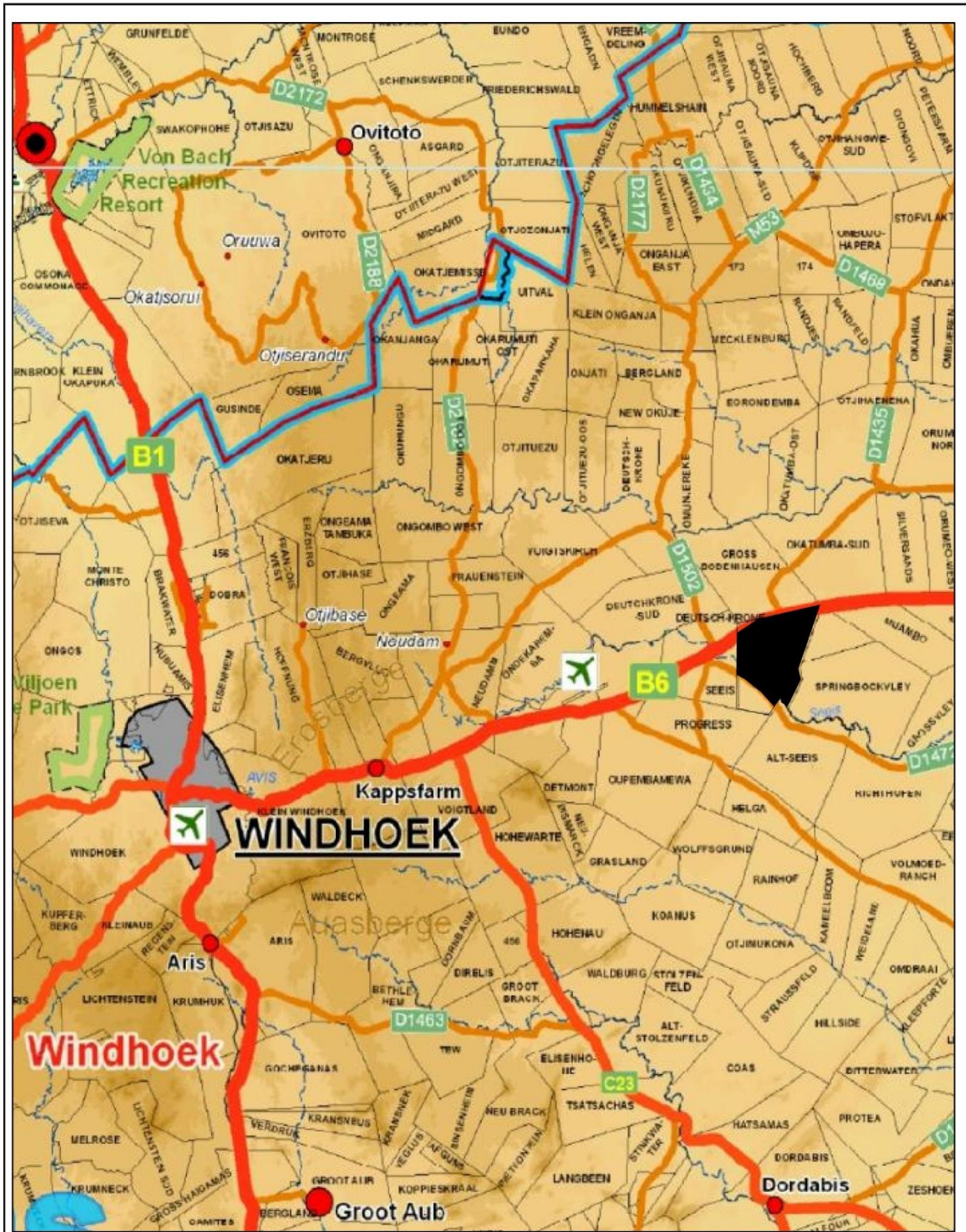
The EIA and EMP from the assessment will be submitted to the Environmental Commissioner for consideration. A renewed Environmental Clearance will only be obtained (from the DEA) once the EIA and EMP has been examined and approved for the listed activities.

The public consultation process as per the guidelines of the Act has been followed. The methods that were used to assess the environmental issues and alternatives included the collection of data on the project site and area from the proponent and identified stakeholders. All other permits, licenses or certificates that are further on required for the operation of the proposed project still needs to be applied for by the proponent.

3. PROJECT DESCRIPTION/SITE INFORMATION

3.1. LOCATION OF THE PROJECT SITE

The project site is located in a section of the Seëis River on the Remainder of Farm Excelsior No. 286, Windhoek, Khomas Region about 60km east of Windhoek, about 5km downstream (to the south) of the Gobabis Trunk Road. The site is located outside the Windhoek Municipal Area. See locality of site below:




<p>Scale: NTS</p> <p>DATE: JUNE 2017</p> <p>PLAN NO. WITWATER_L</p>	<p>LOCALITY PLAN OF RE/FARM EXCELSIOR No. 286</p>	
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Figure 1: Locality of Project Site

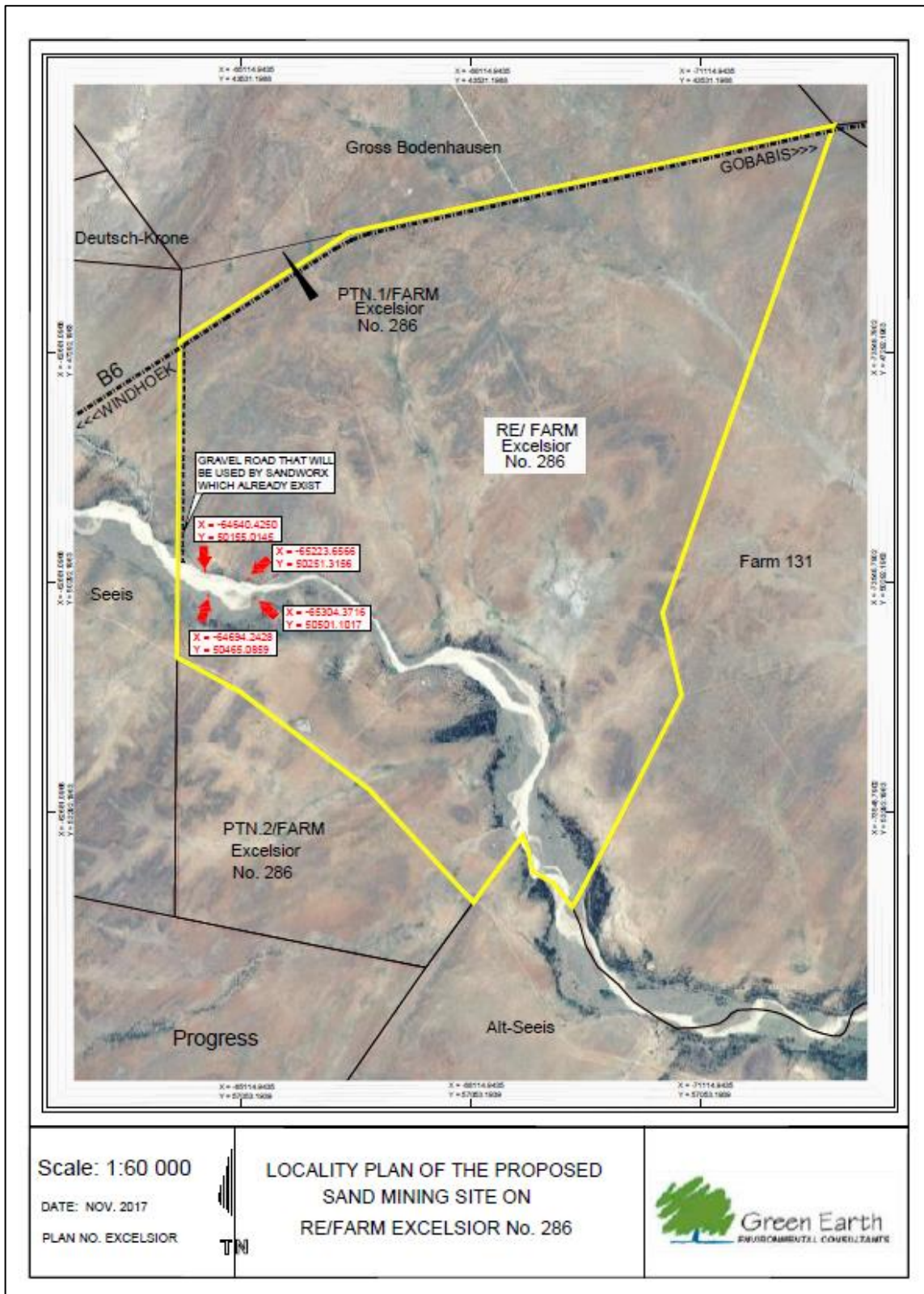


Figure 2: Locality where sand will be mined (1)

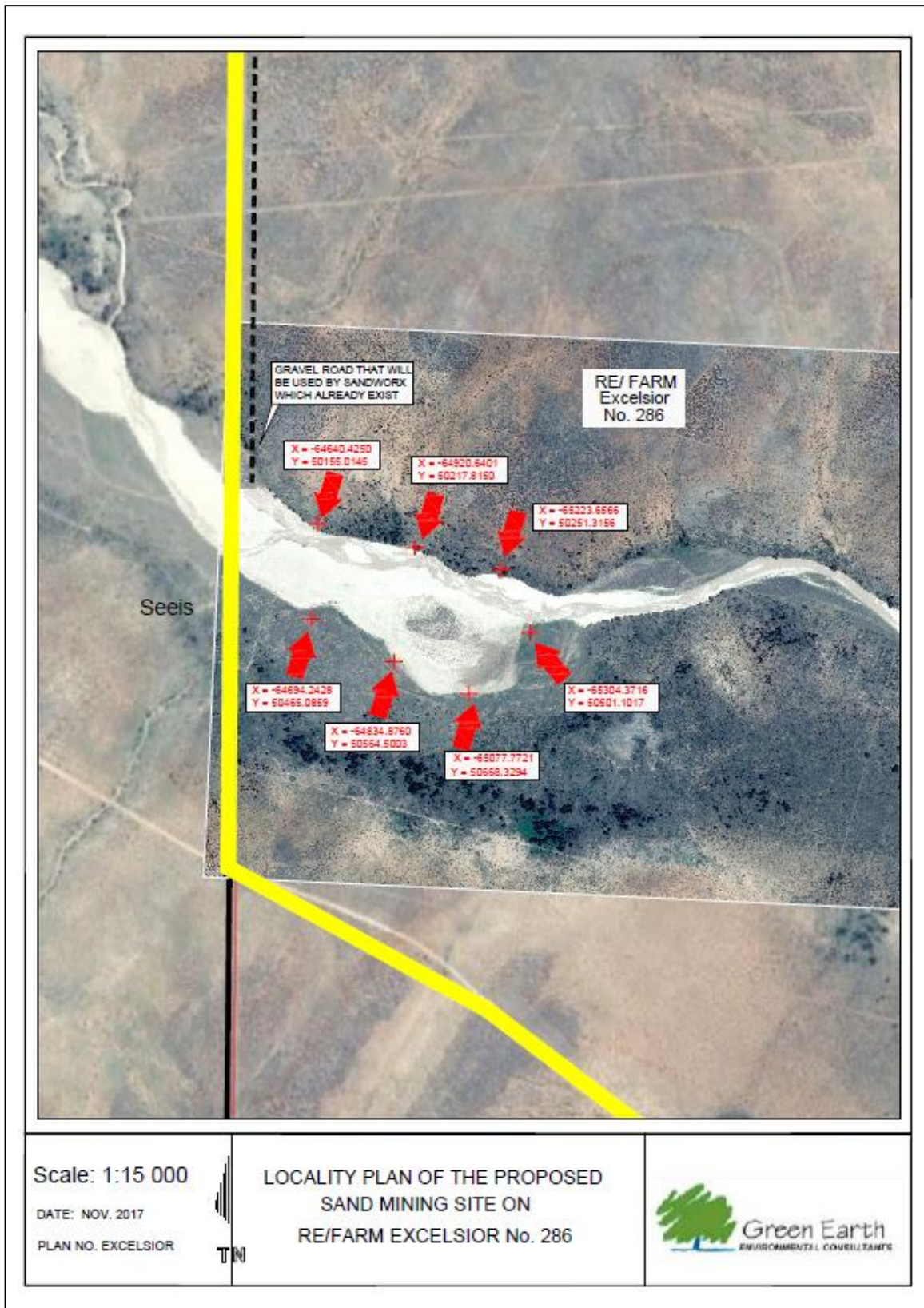


Figure 3: Locality where sand will be mined (2)

3.2. PROJECT DESCRIPTION

The site is used for sand and aggregate mining purposes by Sandworx CC to be used in their own construction and manufacturing of concrete products and will also be sold to clients in the construction industry.

- The volumes of sand / stone / aggregate already mined over the past 3 years is: Sand 75 240m³ and Gravel 64 109m³ from September 2019 to June 2021.
- The volumes of sand and gravel currently being mined per day on average is 300m³.
- Currently six (6) trucks travel per day into Windhoek and back to site.

The mining process is as follows:

This monthly volume might fluctuate in accordance with the demand for Sandworx own purposes as well as that of their clients. The operation includes the following processes, vehicles and machinery:



Figure 4: Screen and hopper, conveyor belt and loader

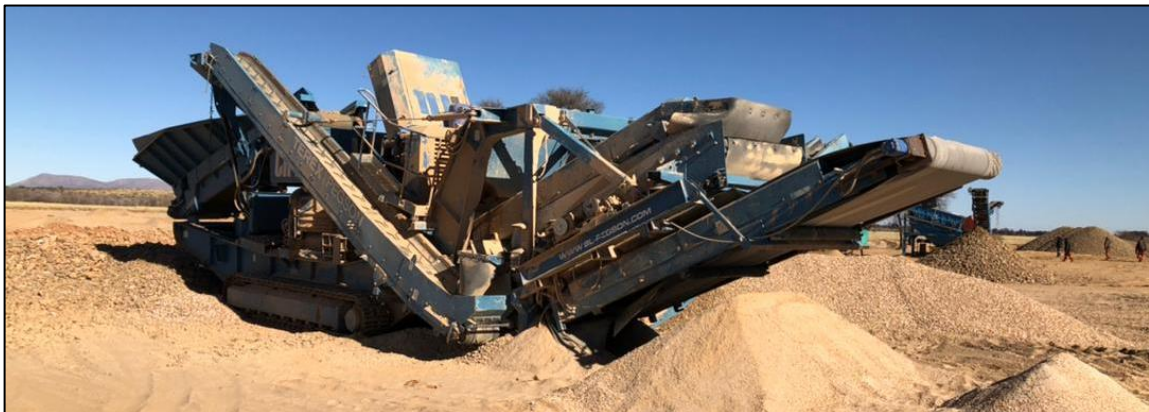


Figure 5: Screen and hopper at storage and handling site with stockpile



Figure 6: Truck transporting stock to market

Mining, stockpiling, screening and transportation

- The sand is excavated in the river by an excavator/loader.
- This sand, including stone and debris is then tipped through a screen into a hopper positioned in the river close to the excavation point.
- This hopper feeds a chain of conveyor belts which transport the sand and stone from the extraction point to the storage, crushing and handling site which is outside of the river.
- This site is cleared and compacted to allow the movement and parking of the large tipper trucks which will collect the sand and stone.
- The material from the extraction point is then fed by the conveyor belt into another hopper and screen where the organic debris, sand and stone are separated.
- The sand and stone are then stockpiled.
- No washing of sand is required as the clay and silt content is very low.
- The stone will be crushed and separated through a screening process into different sizes.
- The sifted sand and processed stone are then stockpiled in separate piles from where the sand is collected by truck to be transported to Sandworx Windhoek depots or directly to clients.
- Existing roads on the Remainder of Farm Excelsior No. 286 is used for the transportation of product to the Trunk Road.
- To supply sand and stone in accordance with the current demand there is two screens, one crusher, conveyor belts, two loaders, one dozer, a silent diesel generator and one bakkie (motor vehicle) on site. This varies from time to time.
- The trucks which collect and transport the sand to the markets will not be stored on site.
- The volumes of sand/stone/filling material mined is recorded as per the permit requirements of the Ministry of Agriculture Water and Forestry.

Maintenance and Supporting services

- Drinking water for the onsite staff is obtained from the farmer.
- No electrical connection is required for the operations. The proponent makes use of a silent generator.
- A container office/store was erected to store tools and house onsite admin staff.

- Diesel is supplied to the site by a Vivo Energy Namibia diesel tanker where it is pump into a small onsite storage tank which is installed on a solid concrete slab with bund walls and spillage containment capacity. The tank has a capacity of 23 000 litres.
- Removable septic tanks with toilets are on site in order to prevent sewer from seeping into the groundwater and all waste is stored in containers/bins in order that baboons and other wild animals have no access to it and to prevent the wind from blowing away waste materials.



Figure 7: Storage Tank (1)



Figure 8: Storage Tank (2)



Figure 9: Vivo Energy Namibia safety measures

Onsite staff requirements and working hours

People is employed on site for the operation of the machinery, transportation of materials, security services and for administrative purposes.

- 39 people is employed on the site and in the transportation of the materials from the site to the end user sites. In addition, 4 contract workers are also employed.
- Only staff which have legal driver's licenses and had proper operator training will be employed in the operations.
- Some personnel reside on the project site.
- A security guard stays on the site when needed.
- The onsite health and safety officer is responsible for overseeing compliance with the approved EMP.
- The mining activities will adhere to normal working hours per day (7h00 to 18h00).

Decommissioning, restoration and refurbishment

- The proponent will be responsible for the decommissioning of the plant and site and the full restoration and refurbishment of the site to ensure that protected trees and plant species as well as the natural water course is reinstated and protected

and to allow the natural replenishment of sand and stone from the seasonal flow of the river.

4. BULK SERVICES AND INFRASTRUCTURE

4.1. ACCESS REQUIREMENTS

The mining site on the Remainder Farm Excelsior No. 286 is accessed directly from the Main Road B6 that leads from Windhoek to Gobabis via a gravel road over the farm. This road will be maintained by the proponent. The alignment and locality of the road is indicated on the plan. The Roads Authority's permission was obtained for the access from the farm road onto Trunk Road B6 and the intersection was constructed in accordance with their requirements.



Figure 10: Entrance to Project Site



Figure 11: Permits displayed at Entrance Gate



Figure 12: Road leading to mining site

4.2. WATER SUPPLY

Water is only required for human consumption (drinking purposes and household requirements) of the workers working and residing on site. No water is required for the mining activities. The water is obtained from the landlord. There is a farm pipeline which supplies water for the farm animals passing in close proximity of the proposed mining site from where a connection was made to supply the mining site.

4.3. ELECTRICITY

Sandworx makes use of a silent generator for all of their operations that need electricity. Diesel is delivered to the site by a Vivo Energy Namibia diesel tanker as and when required.



Figure 13: Silent generator

4.4. SEWAGE DISPOSAL

Only household sewer is generated on the site. The sewage is accommodated in a removable septic tank that was installed on the site. The tank was constructed outside of the river area.

4.5. SOLID WASTE

The solid waste generated on site is stored in an enclosed area in closed containers and is transported back to the Sandworx premises in Windhoek from where it is disposed of through the City of Windhoek's solid waste management collection services.

5. POSSIBLE IMPACTS ON THE RECEIVING ENVIRONMENT

From previous experience with sand and aggregate mining operations, comments received from Interested and Affected Parties as well as observations on site, the proposed project will have / is having the following possible impacts on the receiving environment:

Biophysical impacts:

- The ground and surface water might be affected (water quality, water tables and sustainable water supply on consumers who rely on this water source).
- Surface drainage systems (flow of the river).
- Possibility of air pollution (dust).
- Effect on vegetation (grass, trees and shrubs directly in mining and storage and handling area and along the gravel road).
- Effect on wild and bird life as well as farming animals.
- Effect on natural and general ambiance of the mining area and surroundings.
- Concerns if the area can be restored/rehabilitated to an acceptable status once mining activities are terminated.

Socio-economic impacts:

- Additional employment will be / was created.
- A natural resource will be / is utilized.
- Value will be / is added to a natural resource.
- Stock theft and illegal hunting might increase.
- Noise pollution from operations (day and night).
- Community health issues - transmission of diseases from mining and support staff to local community.
- Increase in criminal activities.
- Impact on existing non-mining operations/community like farmers, tourist operators, hunting safaris, road users, Air Namibia and the Air Port's Company activities as well as NamWater.
- Cultural/heritage impacts.

6. APPROACH TO THE STUDY

The assessment included the following activities:

a) Desktop sensitivity assessment

Literature, legislation, and guidance documents related to the natural environment and land use activities available on the area in general were reviewed in order to determine potential environmental issues and concerns.

b) Site assessment (site visit)

A site visit was conducted 14 July 2021 when the proposed sand mining operations and the immediate neighbourhood and surrounding area were assessed. Previous site visits to investigate the environmental parameters on site to enable further understanding of the potential impacts on site also took place. Meetings were conducted with Sandworx CC and the office of Mr. Gallant of the MAWF to obtain site and operations specific info to be able to have a better understanding of the project.

c) Public participation

The public were invited to give input, comments and opinions regarding the proposed project. Letters have been sent to Interested and Affected Parties (I&APs) and to relevant authorities. Notices were placed in three local newspapers (the Market Watch appearing in the Republikein, New Era and Allgemeine Zeitung of 2 November 2017 and 9 November 2017) on two consecutive weeks inviting the public to participate and provide comments on the proposed project. Notices were also displayed on the project site. Copies of the newspaper notices and photos of the site notices are attached to this report. The closing date for any questions, comments, inputs or information was 24 November 2017. Two public meetings were held namely on 28 November 2017 at 15h00 at the Bridgeview Offices, No. 4 Dr Kwame Nkruma Avenue, Klein Windhoek and on 29 November 2017 at 16h30 at Farm Excelsior No. 286, Seëis, Windhoek. See photos attached.

c) Scoping

Based on the desk top study, site visit and public participation, the environmental impacts were determined in five categories: nature of project, expected duration of impact, geographical extent of the event, probability of occurring and the expected intensity. The findings of the scoping have been incorporated in the environmental impact assessment report below.

7. APPROVALS OBTAINED

7.1. MINISTRY OF ENVIRONMENT, FORESTRY AND TOURISM

The Ministry of Environment, Forestry and Tourism issued an Environmental Clearance Certificate on 26 October 2018 which will expire on 26 October 2021. See below a copy of the ECC:



REPUBLIC OF NAMIBIA

MINISTRY OF ENVIRONMENT AND TOURISM

Tel: (00 26461) 284 2111
Fax: (00 26461) 232 057

Cnr Robert Mugabe &
Dr Kenneth Kaunda Street
Private Bag 13306
Windhoek
Namibia

Enquiries: Mr. Ipeinge Mundjulu
E-mail: ipeinge.mundjulu@met.gov.na

26 October 2018

OFFICE OF THE ENVIRONMENTAL COMMISSIONER

The Managing Member
Sandworx CC
P O Box 11588
Windhoek

Dear Sir/Madam

SUBJECT: ENVIRONMENTAL CLEARANCE CERTIFICATE FOR SAND AND AGGREGATE MINING OPERATIONS IN THE SEEIS RIVER ON THE REMAINDER OF FARM EXCELSIOR NO. 286, WINDHOEK, KHOMAS REGION.

The Environmental Impact Assessment and Environmental Management Plan submitted is sufficient as it made provision of the environmental management concerning the project. From this perspective regular monitoring and evaluation on environmental performance should be conducted. Targets for improvements should be established and monitored from time to time.

This Ministry reserves the right to attach legislative and regulatory conditions during the operational phase of the project. From this perspective, I issue this clearance with the conditions attached on annex A.

On the basis of the above, this letter serves as an environmental clearance certificate for the project to commence. However, this clearance letter does not in any way hold the Ministry of Environment and Tourism accountable for misleading information, nor any adverse effects that may arise from this project's activities. Instead, full accountability rests with Sandworx CC.

This environmental clearance certificate is valid for a period of 3 (three) years, from the date of issue unless withdrawn by this office.

Yours sincerely,

Teofilus Nghitila
ENVIRONMENTAL COMMISSIONER



“Stop the poaching of our rhinos”

All official correspondence must be addressed to the Permanent Secretary

**APPENDIX A - CONDITIONS ATTACHED TO ENVIRONMENTAL CLEARANCE
CERTIFICATE FOR SAND MINING**

1. In the case of private land not owned by the lease holder an affidavit should be obtained regarding consent of the concerned land owner (s) for carrying out the mining operation.
2. Valid permit from the Relevant Competent Authority to be obtained for riverbed sand mining, vegetation clearing of protected plant species and boreholes drilling prior to commencement of the project.
3. All conditions provided by the Relevant Competent Authority with regards to riverbed sanding mining must be complied with.
4. The Holder shall erect a signboard not smaller than 70 cm in height and 100cm in width, at the major entrance/s to each of its Sand Mining Site /Area, specifying the duration of the EC validity and the name of the EC holder, and a contact name and number for enquiries.
5. Mining shall be done in layers of 1 m depth to avoid ponding effect and after first layer is excavated, the process will be repeated for the next layers; All possible precaution as identified in the Environmental Management Plan shall be complied with to prevent and mitigate potential impacts.
6. No exposure of groundwater should take place in respect of Sand mining activities undertaken within a riverbed.
7. Depending upon the location, thickness of sand, deposition, agricultural land/river bed, the method of mining may be manual, semi-mechanized or mechanized; however, manual method of mining shall be preferred over any other method.
8. The EC holder shall keep a correct account of quantity of sand mined out, dispatched from the site, mode of transport, registration number of vehicle, person in-charge of vehicle and site plan. This should be produced before inspectors at any time.
9. Restricted working hours: Sand mining operation has to be carried out between 7 am to 5 pm.
10. Pollution due to dust, exhaust emission or fumes during mining and processing phase should be controlled and kept in permissible limits specified under environmental laws.
11. Restoration of flora affected by mining should be done immediately. Twice the number of trees destroyed by mining be planted preferably of indigenous species;
12. No overhangs shall be allowed to be formed due to mining and mining shall not be allowed in areas where subsidence of rocks is likely to occur due to steep angle of slope.
13. No extraction of stone / boulder / sand in landslide prone areas.
14. Dumping of waste shall be done in earmarked places as approved in the plan;
15. Sand mining sites should not be located within 100 meters from the edge of National Highway and railway line, 60 meters from water reservoir, 25 meter from the edge of other roads except on special exemption from relevant authority.
16. Junction at take-off point approach road with main road be properly developed with proper width and geometry required for safe movement of traffic by lease holder at his own cost.

8. ASSUMPTIONS AND LIMITATIONS

It is assumed that the information provided by the proponent (Sandworx CC), the landlord (Mr Johan Deysel) and the other relevant parties is accurate. Alternative sites were not evaluated as the proposed site is the site allocated by the landlord. This site is located close to the main road and sand had been mined in this area which means that the proposed activity will have / is having a minimum impact on the prevailing environment. The site was visited several times and any happenings after this are not mentioned in this report. (The assessment was based on the prevailing environmental conditions and not on future happenings on the site.) However, it is assumed that there will be no significant changes to the proposed project, and the environment will not adversely be affected between the compilation of the assessment and the implementation of the proposed activities.

9. ADMINISTRATIVE, LEGAL AND POLICY REQUIREMENTS

To protect the environment and achieve sustainable development, all projects, plans, programs and policies deemed to have adverse impacts on the environment require an EIA according to Namibian legislation. The administrative, legal and policy requirements to be considered during the Environmental Assessment for the proposed project are the following:

THE NAMIBIAN CONSTITUTION

Article 95 of Namibia's constitution provides that:

"The State shall actively promote and maintain the welfare of the people by adopting, inter alia, policies aimed at the following:

Management of ecosystems, essential ecological processes and biological diversity of Namibia and utilization of living natural resources on a sustainable basis for the benefit of all Namibians, both present and future; in particular, the Government shall provide measures against the dumping or recycling of foreign nuclear and toxic waste on Namibian territory." This article recommends that a relatively high level of environmental protection is called for in respect of pollution control and waste management.

Article 144 of the Namibian Constitution deals with environmental law and it states:

"Unless otherwise provided by this Constitution or Act of Parliament, the general rules of public international agreements binding upon Namibia under this Constitution shall form part of the law of Namibia". This article incorporates international law, if it conforms to the Constitution, automatically as "law of the land". These include international agreements, conventions, protocols, covenants, charters, statutes, acts, declarations, concords, exchanges of notes, agreed minutes, memoranda of understanding, and agreements (*Ruppel & Ruppel-Schlichting, 2013*).

CONCLUSION AND IMPACT

In considering the environmental rights, Sandworx CC should consider the following in devising an action plan in response to the articles:

- Implement a “zero-harm” policy that would guide decisions.
- Ensure that no management practice or decision result in the degradation of future natural resources.
- Take a decision on how this part of the Constitution will be implemented as part of Sandworx CC’ Environmental Control System (ECS).

THE SOIL CONSERVATION ACT (NO. 76 OF 1969)

The Soil Conservation Act (No. 76 of 1969) stipulates that the combating and preventing of soil erosion should take place; the soil should also be conserved, protected and improved, vegetation and water sources and resources should also be preserved and maintained.

In terms of the Soil Conservation Act the general conditions to which sand mining operators should adhered to are specific and are the following:

1. The area where removal of sand and gravel takes place shall be left clean and in a neat condition when the approval expires.
2. Excavation of sand shall be at least 200 meters from any developed areas/plots in the flood plains and on the river banks in this case including the District Road crossing.
3. Excavation of sand should be at least 10 meters away from the river banks and vertical slopes resulting from excavations shall not be higher than 1 meter.
4. Excavation shall under no circumstances expose the ground water table and shall have slopes not higher than 4 meters.
5. The normal underground flow of water in the river as well as the periodic visible run-off and floods shall under no circumstances be polluted, clocked or deflected.
6. The permission excludes the right of access to private properties and where applicable, permission shall separately be obtained from the particular landowner by holder.
7. A return in respect of the previous month shall be submitted, on or before the 7th day of the following month to the Control Officer: Abstraction Control, Private Bag 13193, Windhoek and shall reflect the volume of sand and gravel removed during the previous month.

8. The Factory, Machinery and Building Work, Ordinance, 1952 and any applicable regulations promulgated there under, shall be adhered to.
9. All possible precautions shall be taken to prevent damaged to the river banks during excavation of sand and gravel.
10. The Permanent Secretary or his authorized representative in consultation with the Minister reserves the right to:
 - 10.1 check the volume of sand and gravel removed at any time:
 - 10.2 carry out periodic inspections to determine whether the conditions of this approval are adhered to: and
 - 10.3 withdraw, amend or substitute any condition of the approval or withdraw it in its entirety, after reasonable notice to the holder.
11. Subject to the provision of condition 10.3 the validity period of his permission shall otherwise expire every five years from the date of this permission. Extension of the validity period shall be considered on your written request, which must be in the hands of the Permanent Secretary at least two months before each expiry date.

These conditions were confirmed in a meeting with Mr. Gallant who is the Senior Administrative Officer of the Department of Water Affairs who is responsible for issuing the permits for sand and gravel excavation from rivers. Issuing the Permit was subject to obtaining an Environmental Clearance for the proposed project.

CONCLUSION AND IMPACT

Adhering to the guidelines set by the Ministry of Agriculture, Water and Forestry and the Environmental Management Plan during the mining and associated activities, will minimize the impact on the prevailing environment and allow the proper restoration of the site to protect trees, the riverbanks and the flow of the river.

THE MEMORANDUM OF AGREEMENT FOR THE SALE OF SAND AND AGGREGATE BETWEEN THE LANDLORD AND THE PROPONENT

The mining of sand, aggregate and filling material will be done under a duly signed 'AGREEMENT OF SALE OF AGGREGATE' between Mr Johan Deysel (the registered landlord) and Sandworx CC (the Proponent). A copy of the agreement is attached to this document.

ENVIRONMENTAL MANAGEMENT ACT (NO. 7 OF 2007)

The Environmental Impact Assessment Regulations (GN 30 in GG 4878 of 6 February 2012) of the Environmental Management Act (No. 7 of 2007) that came into effect in 2012

requires/recommends that an Environmental Impact Assessment Renewal and an Environmental Management Plan (EMP) be conducted for the following listed activities in order to obtain an Environmental Clearance Certificate:

MINING AND QUARRYING ACTIVITIES

- *The construction of facilities for any process or activities which requires a licence, right or other form of authorisation, and the renewal of a licence, right or other form of authorisation, in terms of the Minerals (Prospecting and Mining Act), 1992.*
- *Other forms of mining or extraction of any natural resources whether regulated by law or not.*
- *Resource extraction, manipulation, conservation and related activities.*

Cumulative impacts associated with the project must be included as well as public consultation. The Act further requires all major industries to prepare waste management plans and present these to the local authorities for approval.

The Act, Regulations, Procedures and Guidelines have integrated the following sustainability principles. They need to be given due consideration, particularly to achieve proper waste management and pollution control:

Cradle to Grave Responsibility

This principle provides that those who handle or manufacture potentially harmful products must be liable for their safe production, use and disposal and that those who initiate potentially polluting activities must be liable for their commissioning, operation and decommissioning.

Precautionary Principle

If there is any doubt about the effects of a potentially polluting activity, a cautious approach must be adopted.

The Polluter Pays Principle

A person who generates waste or causes pollution must, in theory, pay the full costs of its treatment or of the harm, which it causes to the environment.

Public Participation and Access to Information

In the context of environmental management, citizens must have access to information and the right to participate in decisions making.

The Environmental Commissioner may attach further conditions to the Environmental Clearance Certificate, if issued, including the following:

1. In the case of private land not owned by the lease holder an affidavit should be obtained regarding consent of the concerned land owner (s) for carrying out the mining operation.

2. Valid permit from the Relevant Competent Authority to be obtained for riverbed sand mining, vegetation clearing of protected plant species and boreholes drilling prior to commencement of the project.
3. All conditions provided by the Relevant Competent Authority with regards to riverbed sanding mining must be complied with.
4. The Holder shall erect a signboard not smaller than 70cm in height and 100cm in width, at the major entrance/s to each of its Sand Mining site/ Area, specifying the duration of the EC validity and the name of the EC holder, and a contact name and number for enquiries.
5. Mining shall be done in layers of 1m depth to avoid ponding effect and after first layer is excavated, the process will be repeated for the next layers; All possible precaution as identified in the Environmental Management Plan shall be complied with to prevent and mitigate potential impacts.
6. No exposure of groundwater should take place in respect of Sand mining activities undertaken within a riverbed.
7. Depending upon the location, thickness of sand, deposition, agricultural land/river bed, the method of mining may be manual, semi-mechanized or mechanized; however, manual method of mining shall be preferred over any other method.
8. The EC holder shall keep a correct account of quantity of sand mined out, dispatched from the site, mode of transport, registration number of vehicle, person in-charge of vehicle and site plan. This should be produced before inspectors at any time.
9. Restricted working hours: Sand mining operation has to be carried out between 7 am to 5 pm.
10. Pollution due to dust, exhaust emission of fumes during mining and processing phase should be controlled and kept in permissible limits specified under environmental laws.
11. Restoration of flora affected by mining should be done immediately. Twice the number of trees destroyed by mining be planted preferably of indigenous species;
12. No overhangs shall be allowed to be formed due to mining and mining shall not be allowed in areas where subsidence of rocks is likely to occur due to steep angle of slope.
13. No extraction of stones / boulder / sand is landslide prone areas.
14. Dumping of waste shall be done in earmarked places as approved in the plan.

15. Sand mining sites should not be located within 100 meters from the edge of National Highway and railway line, 60 meters from water reservoir, 25 meter from the edge of other roads except on special exemption from relevant authority.
16. Junction at take-off point approach road with main road be properly developed with proper width and geometry required for safe movement of traffic by lease holder at his own cost.
17. The proponent must ensure that the site is rehabilitated to economically functional state on completion of the mining activities.

CONCLUSION AND IMPACT

The proposed sand mining activities have been assessed in terms of the Environmental Management Act (No. 7 of 2007) and the Regulations (2012). From the assessment, it can be concluded that the activities will have impacts on the prevailing environment but that the negative impacts can be sufficiently mitigated and managed by following the Environmental Management Plan which is part of this document.

Table 1: Other laws, acts, regulations and policies

Laws, Acts, Regulations & Policies consulted:		
Electricity Act (No. 4 of 2007)	In accordance with the Electricity Act (No. 4 of 2007) which provides for the establishment of the Electricity Control Board and provide for its powers and functions; to provide for the requirements and conditions for obtaining licenses for the provision of electricity; to provide for the powers and obligations of licenses; and to provide for incidental matters: the necessary permits and licenses will be obtained.	The Proponent must abide to the Electricity Act.
Pollution Control and Waste Management Bill (guideline only)	The Pollution Control and Waste Management Bill is currently in preparation and is therefore included as a guideline only. Of reference to the mining, Parts 2, 7 and 8 apply. Part 2 provides that no person shall discharge or cause to be discharged, any pollutant to the air from a process except under and in accordance with the provisions of an air pollution	The Proponent must adhere to the Pollution Control and Waste Management Bill.

	<p>license issued under section 23. Part 2 also further provides for procedures to be followed in license application, fees to be paid and required terms of conditions for air pollution licenses. Part 7 states that any person who sells, stores, transports or uses any hazardous substances or products containing hazardous substances shall notify the competent authority, in accordance with subsection (2), of the presence and quantity of those substances. The competent authority for the purposes of section 74 shall maintain a register of substances notified in accordance with that section and the register shall be maintained in accordance with the provisions. Part 8 provides for emergency preparedness by the person handling hazardous substances, through emergency response plans.</p>	
<p>Water Resources Management Act</p>	<p>The Water Resources Management Act (No. 11 of 2013) stipulates conditions that ensure effluent that is produced to be of a certain standard. There should also be controls on the disposal of sewage, the purification of effluent, measures should be taken to ensure the prevention of surface and groundwater pollution and water resources should be used in a sustainable manner.</p>	<p>The Act must be consulted. Fresh water abstraction and waste-water discharge permits should be obtained when required.</p>
<p>Solid and Hazardous Waste Management Regulations: Local Authorities 1992</p>	<p>Provides for management and handling of industrial, business and domestic waste.</p>	<p>The Proponent must abide to the solid waste management provisions.</p>
<p>Hazardous Substances Ordinance</p>	<p>The Ordinance applies to the manufacture, sale, use, disposal and dumping of hazardous</p>	<p>The Proponent must abide to the Ordinance's provisions.</p>

(No. 14 of 1974)	substances, as well as their import and export and is administered by the Minister of Health and Social Welfare. Its primary purpose is to prevent hazardous substances from causing injury, ill-health or the death of human beings.	
Atmospheric Pollution Prevention Ordinance of Namibia (No. 11 of 1976)	Part 2 of the Ordinance governs the control of noxious or offensive gases. The Ordinance prohibits anyone from carrying on a scheduled process without a registration certificate in a controlled area. The registration certificate must be issued if it can be demonstrated that the best practical means are being adopted for preventing or reducing the escape into the atmosphere of noxious or offensive gases produced by the scheduled process.	The proponent should adhere to the stipulations of the Atmospheric Pollution Prevention Ordinance.
Nature Conservation Ordinance	The Nature Conservation Ordinance (No. 4 of 1975) covers game parks and nature reserves, the hunting and protection of wild animals, problem animals, fish and indigenous plant species. The Ministry of Environment, Forestry and Tourism (MEFT) administer it and provides for the establishment of the Nature Conservation Board.	The proposed project implementation is not located in a demarcated conservation area, national park or unique environments.
Forestry Act	The Forestry Act (No. 12 of 2001) specifies that there be a general protection of the receiving and surrounding environment. The protection of natural vegetation is of great importance, the Forestry Act especially stipulates that no living tree, bush, shrub or indigenous plants within 100m from any river, stream or watercourse, may be removed without the necessary license.	No removal of protected tree species or removal of mature trees should happen. The Ministry of Environment, Forestry and Tourism should be consulted when required.
EU Timber Regulation: FSC (2013)	Forest Stewardship Council (FSC) came into effect in March 2013, with the aim of preventing sales of illegal timber and timber products	The Proponent is advised to adhere to the regulation.

	<p>in the EU market. Now, any actor who places timber or timber products on the market for the first time must ensure that the timber used has been legally harvested and, where applicable, exported legally from the country of harvest.</p>	
Labour Act	<p>The Labour Act (No. 11 of 2007) contains regulations relating to the Health, Safety and Welfare of employees at work. These regulations are prescribed for among others safety relating to hazardous substances, exposure limits and physical hazards. Regulations relating to the Health and Safety of Employees at Work are promulgated in terms of the Labour Act 6 of 1992 (GN156, GG1617 of 1 August 1997).</p>	<p>The proponent and contractor should adhere to the Labour Act.</p>
Communal Land Rights	<p>Communal land is land that belongs to the State and is held in trust for the benefit of the traditional communities living in those areas. Communal land cannot be bought or sold, but one can be given a customary land right or right of leasehold to a part of communal land in accordance with the provisions of the Communal Land Reform Act (No. 5 of 2002) and Communal Land Reform Amendment Act (No. 13 of 2013). The Communal Land Reform Act provide for the allocation of rights in respect of communal land to establish Communal Land Boards to provide for the powers of Chiefs and Traditional Authorities and boards in relation to communal land and to make provision for incidental matters. Consent and access to land for the proposed project should be requested from the relevant traditional authority through the Regional Council and Regional Communal Land Boards.</p>	<p>Consent should be obtained from Traditional Authorities, Communal Boards, Chiefs, Kings, Queens etc. if required.</p>

<p>Traditional Authorities Act (No. 17 of 1995)</p>	<p>The Traditional Authorities Act (No. 17 of 1995) provide for the establishment of traditional authorities, the designation and recognition of traditional leaders; to define their functions, duties and powers; and to provide for matters incidental thereto.</p>	<p>Traditional Authorities should be consulted when required.</p>
<p>Public and Environmental Health Act</p>	<p>The Public and Environmental Health Act (No. 1 of 2015) provides with respect to matters of public health in Namibia. The objects of this Act are to: (a) promote public health and wellbeing; (b) prevent injuries, diseases and disabilities; (c) protect individuals and communities from public health risks; (d) encourage community participation in order to create a healthy environment; and (e) provide for early detection of diseases and public health risks.</p>	<p>The proponent and contractor should adhere to the Public and Environmental Health Act.</p>
<p>Coronavirus (Covid-19) Pandemic</p>	<p>The current global Coronavirus (Covid-19) pandemic and the associated State of Emergency and health restrictions globally may result in some delays and logistic disruptions. The pandemic might have an impact on obtaining equipment, specialist workforce mobilisation and implementation of the project. The health restrictions may have an impact on campsite set-up, traveling of personal/workers and building of the infrastructure. The proponent, contractor and subcontractors should adhere to all the international, regional and local Covid-19 health restrictions and protocols.</p>	<p>The proponent, contractor and workforce should adhere to the restrictions and regulations.</p>
<p>National Heritage Act (No. 27 of 2004)</p>	<p>All protected heritage resources discovered need to be reported immediately to the National Heritage Council (NHC) and require a permit from the NHC before it may be relocated. This should be applied from the NHC.</p>	<p>The National Heritage Council should be consulted when required.</p>

<p>National Monuments Act of Namibia (No. 28 of 1969) as amended until 1979</p>	<p>No person shall destroy, damage, excavate, alter, remove from its original site or export from Namibia: (a) any meteorite or fossil; or (b) any drawing or painting on stone or a petroglyph known or commonly believed to have been executed by any people who inhabited or visited Namibia before the year 1900 AD; or (c) any implement, ornament or structure known or commonly believed to have been used as a mace, used or erected by people referred to in paragraph; or (d) the anthropological or archaeological contents of graves, caves, rock shelters, middens, shell mounds or other sites used by such people; or (e) any other archaeological or palaeontological finds, material or object; except under the authority of and in accordance with a permit issued under this section.</p>	<p>The proposed site for development is not within any known monument site both movable or immovable as specified in the Act, however in such an instance that any material or sites or archeologic importance are identified, it will be the responsibility of the developer to take the required route and notify the relevant commission.</p>
<p>Public Health Act (No. 36 of 1919)</p>	<p>Under this act, in section 119: "No person shall cause a nuisance or shall suffer to exist on any land or premises owned or occupied by him or of which he is in charge any nuisance or other condition liable to be injurious or dangerous to health."</p>	<p>The proponent will ensure that all legal requirements of the project in relation to protection of the health of their employees and surrounding residents is protected and will be included in the EMP. Relevant protective equipment shall be provided for employees in construction. The development shall follow requirements and specifications in relation to water supply and sewerage handling and solid waste management so as not to threaten public health of future residents on this piece of land.</p>
<p>Soil Conservation Act (No. 76 of 1969)</p>	<p>The objectives of this Act are to: Make provisions for the combating and prevention of soil erosion; Promote the conservation,</p>	<p>Only the area required for the operations should be cleared from vegetation to ensure the minimum impact on the soil</p>

	protection and improvement of the soil, vegetation, sources and resources of the Republic;	through clearance for construction.
Air Quality Act (NO. 39 of 2004)	The Air Quality Act (No. 39 of 2004) intends to provide for national norms and standards regulating air quality monitoring, management and control by all spheres of government; for specific air quality measures; and for matters incidental thereto.	The proponent and contractor should adhere to the Air Quality Act.
Vision 2030 and National Development Plans	Namibia's overall development ambitions are articulated in the Nation's Vision 2030. At the operational level, five-yearly national development plans (NDP's) are prepared in extensive consultations led by the National Planning Commission in the Office of the President. Currently the Government has so far launched a 4th NDP which pursues three overarching goals for the Namibian nation: high and sustained economic growth; increased income equality; and employment creation.	The proposed project is an important element in employment creation.

CONCLUSION AND IMPACT

It is believed the above administrative, legal and policy requirements which specifically guide and governs mining will be followed and complied with in the planning, implementation and operations of the mining activity.

A flowchart indicating the entire EIA process is shown in the *Figure* below:

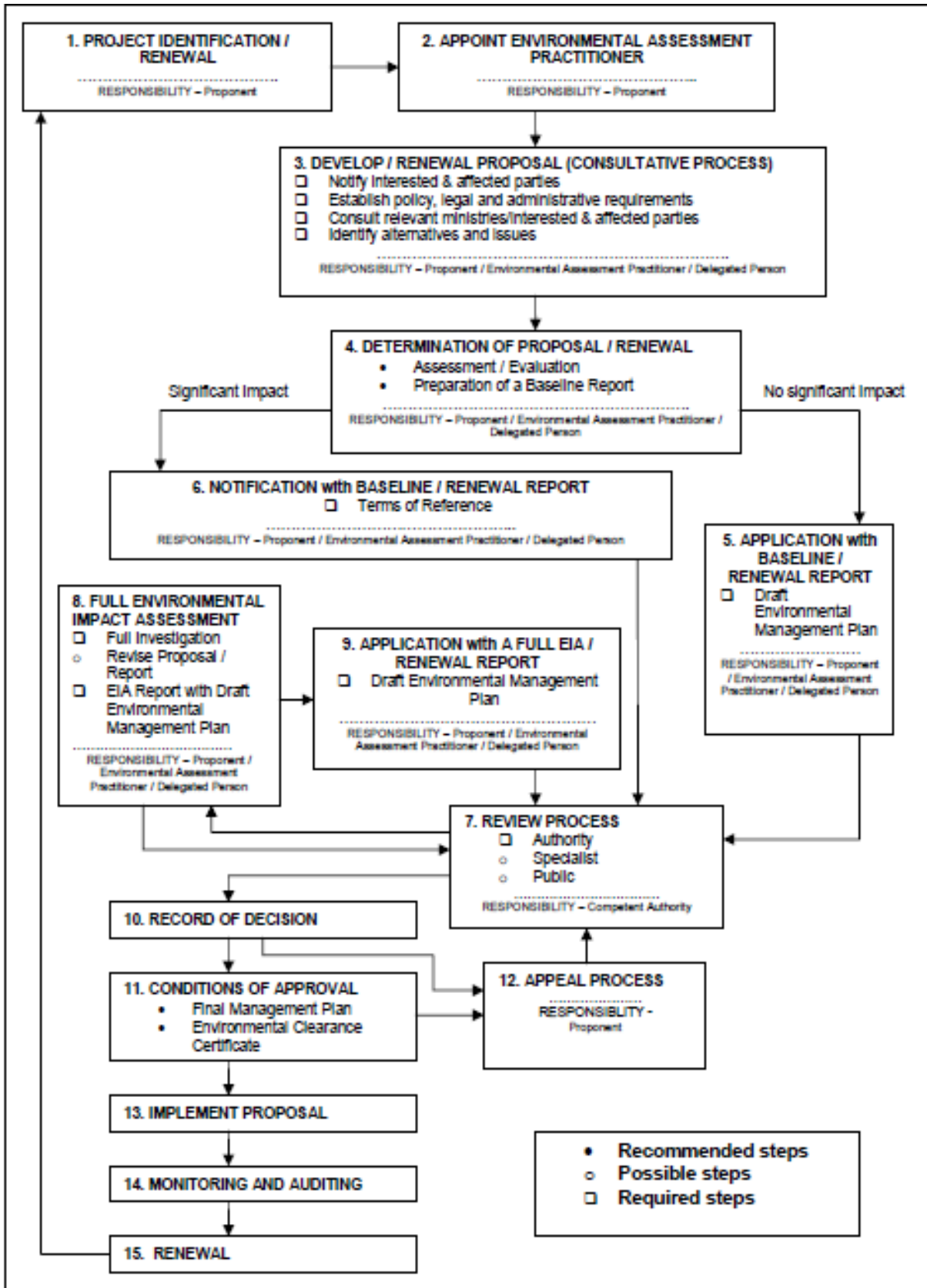


Figure 14: Flowchart of the assessment Process

10. AFFECTED NATURAL AND SOCIAL ENVIRONMENT

10.1. CLIMATE

In broad terms the climate can be described as semi-arid, with summer rainfalls and highest temperatures occurring during October and February. Maximum temperatures recorded in the area vary just under 40 degrees Celsius with an average annual temperature of more than 22 degrees Celsius (*Weather - the Climate in Namibia, 1998 – 2012*).

Rainfall in the form of thunderstorms is experienced in the area during the summer months between October and April. It is further characterised by relatively low average mean annual rainfall of 350 - 400mm in comparison to 250mm for the entire country. Over 70% of the rainfall occurs in the period between November and March with mean annual gross evaporation of 2600-2800mm (*Weather - the Climate in Namibia, 1998 – 2012*).

The prevailing wind direction is expected to prevent the spread of any nuisance namely noise and smell.

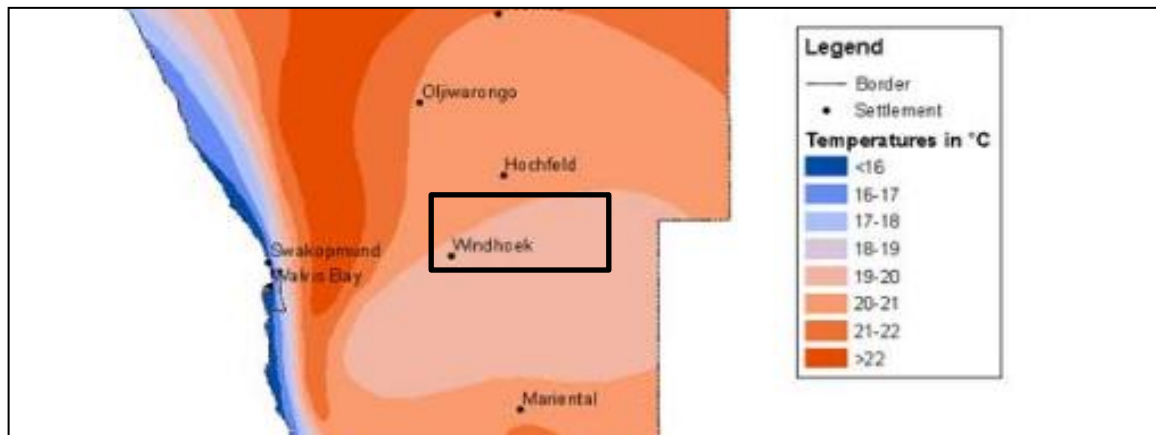


Figure 15: Average temperatures (*Atlas of Namibia Project, 2002*)

CONCLUSION AND IMPACT

The sand mining will not have an impact on the climate.

10.2. GEOLOGY, SOILS AND GEOHYDROLOGY

The sand mining operations is in the Khomas Trough on a geological area classified as Damara Supergroup and Gariiep Complex. See *Map* below. From an environmental perspective, care should be taken that the rates of sand extraction do not exceed the natural sediment yield of the river systems, resulting in a net loss of sand from the broader system. When sand and gravel are extracted in quantities higher than is sustainable, changes take place in the river's ecosystem, such as in its channel form, physical habitats and food webs. The removal of sand from the riverbed increases the speed of flowing water, which in turn erodes the riverbanks. Sand also acts as a sponge, which helps in

recharging the water table. Thus the progressive depletion of a river is accompanied by sinking water tables, which has an adverse impact on nearby communities. Sand eroded from upper catchments and transported by rivers is deposited along Riverbanks and floodplains where it sustains a riparian habitat and provides fertile ground for agriculture.

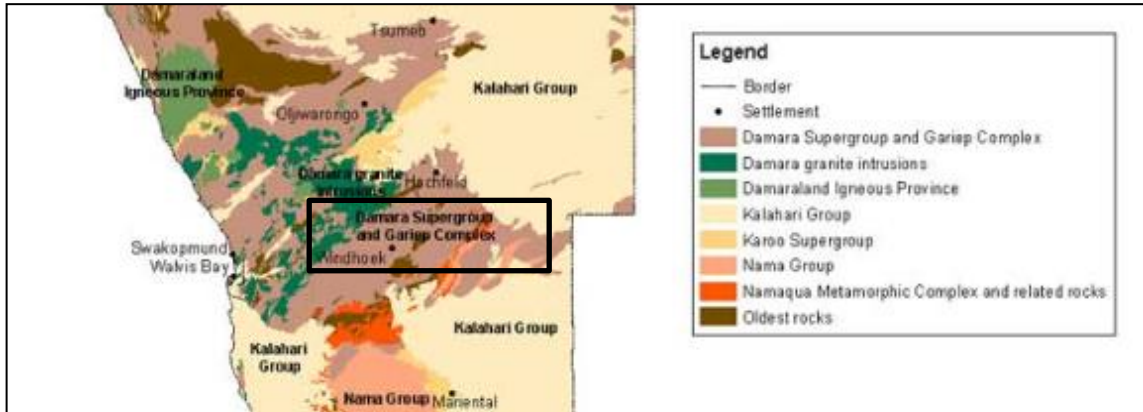


Figure 16: Geology of Namibia (Atlas of Namibia Project, 2002)



Figure 17: Soil type

CONCLUSION AND IMPACT

The sand mining activities will not impact on the geology, soils and geohydrology of the area. The surface drainage canals will be kept open in order that water can flow through.

10.3. PREVAILING HYDROGEOLOGY

The bedrock geology of the area consists primarily of highly deformed rocks of the Kuiseb Formation rocks of the Swakop Group. The dominant lithologies are metagreywacke and mica schist.

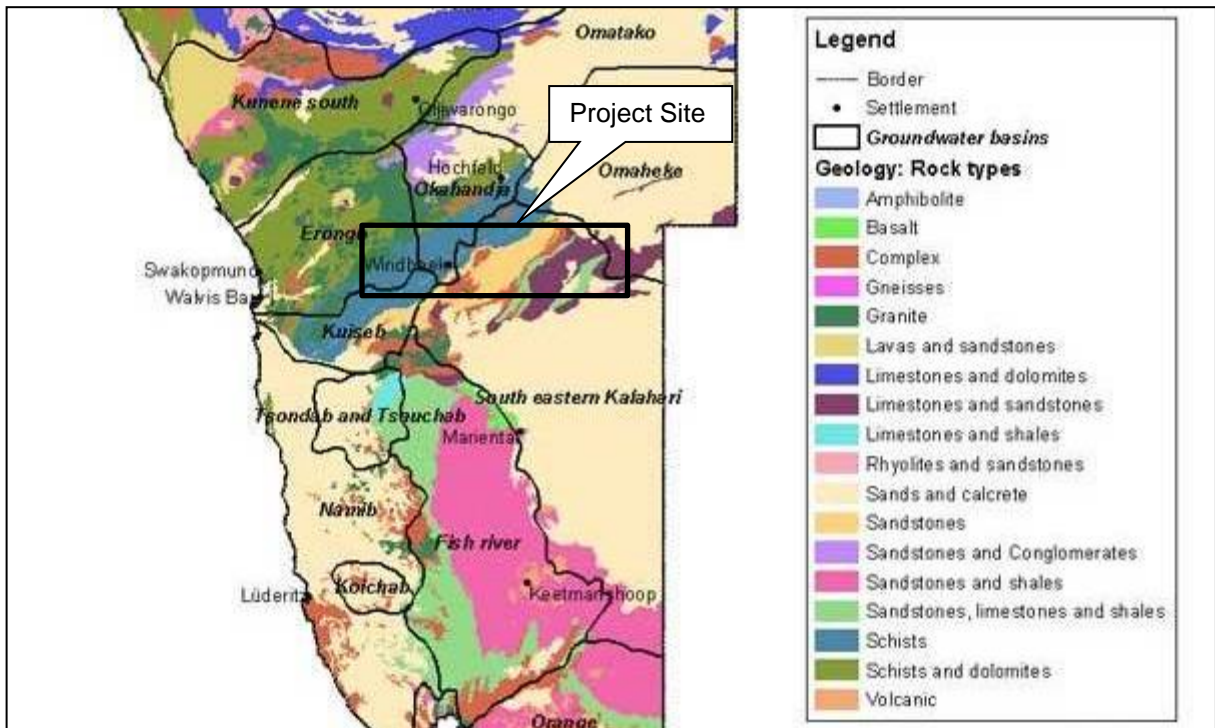


Figure 18: Groundwater basins and rock types (Atlas of Namibia Project, 2002)

Structures present in the larger area are mainly north-south faults and joint systems. The north-south fault systems are less developed in the micaceous lithologies of the Kuiseb Formation rocks, as the mica schist undergoes plastic deformation rather than brittle fracturing. No faults are mapped within the operations area.

Some geological observations made during the field visit are:

- The schist is generally more massive and foliation is not very well developed.
- Some north-west – south-east striking joints are cross-cutting the schist.
- Quite a lot of quartz veins are present.
- The area is largely covered by a thin “quartz-pebble mulch” covering much of the soil horizon.

To understand the occurrence of groundwater and the potential pollution impact of the proposed project on groundwater, it is necessary to describe the prevailing geohydrological conditions, and to understand some of the fundamental geohydrological concepts. The predominant geology is the determining factor in the behaviour and characteristics of the geohydrological environment. The underlying geology is primarily schist, which is considered having a low groundwater potential and low risk of groundwater contamination.

Along drainage channels and rivers, alluvium may be found which have a moderate to high groundwater potential, with an associated higher risk of groundwater pollution. The main aquifer type found in the area is secondary fractured aquifers hosted in the mica schist of the Kuiseb Formation, with perceived limited (small) aquifers formed along the ephemeral river courses that are associated with river alluvial, or where groundwater recharge takes place during flood events.

Schist, being a naturally poor host of groundwater, acts as an aquiclude, or when hosting groundwater, at best as an aquatard. The weathering product of schist is clayey material, which also is not favourable for transmitting groundwater. The field observations made regarding some of characteristics of the schist, namely its massive nature together with cross-cutting joints, is important in that:

1. The massive schist will be even more impervious than well-foliated schist, thereby further reducing the potential for groundwater flow.
2. The joints, if open at depth, will have higher transmissivity in relation to the matrix rock transmissivity, thus resulting in higher percolation rates and flow rates of groundwater in the joints.
3. If the quartz veins are a result of quartz intrusion from depth, these veins can act as preferential flow paths, and it can also store significant quantities of groundwater, thus it can potentially act as good secondary aquifers.

It must however be borne in mind that, even if flow rates can be higher in certain parts of the schist, the rock type in general is at best an aquatard. Furthermore, the “geohydrologically better” portion of the schist in relation to the “geohydrologically poor” portion of the schist is most likely negligibly small. The most significant negative aspect of this higher transmissivity characteristic in joint zones is that pollutants can enter and disperse through such joint zones much easier. At the same time however, it will be extremely difficult to remove or abstract any pollutant from the schist due to its over-all poor transmissivity.

The information suggests that the area in general has poor groundwater potential and the predominant geology in the area results in little risk of groundwater contamination, *unless* pollutants end up in geological structures acting as preferential groundwater flow paths (faults or open joints) or along the river courses where groundwater flow in the alluvial sediments will be higher. Under such conditions the transmissivity is higher; therefore, the potential to easily transmit pollutants can also be moderate to high.

The Hydrogeological Map of Namibia shows that the study area falls in a zone of rock bodies with little groundwater potential (generally low; locally moderate potential) in an area of metamorphic rocks.

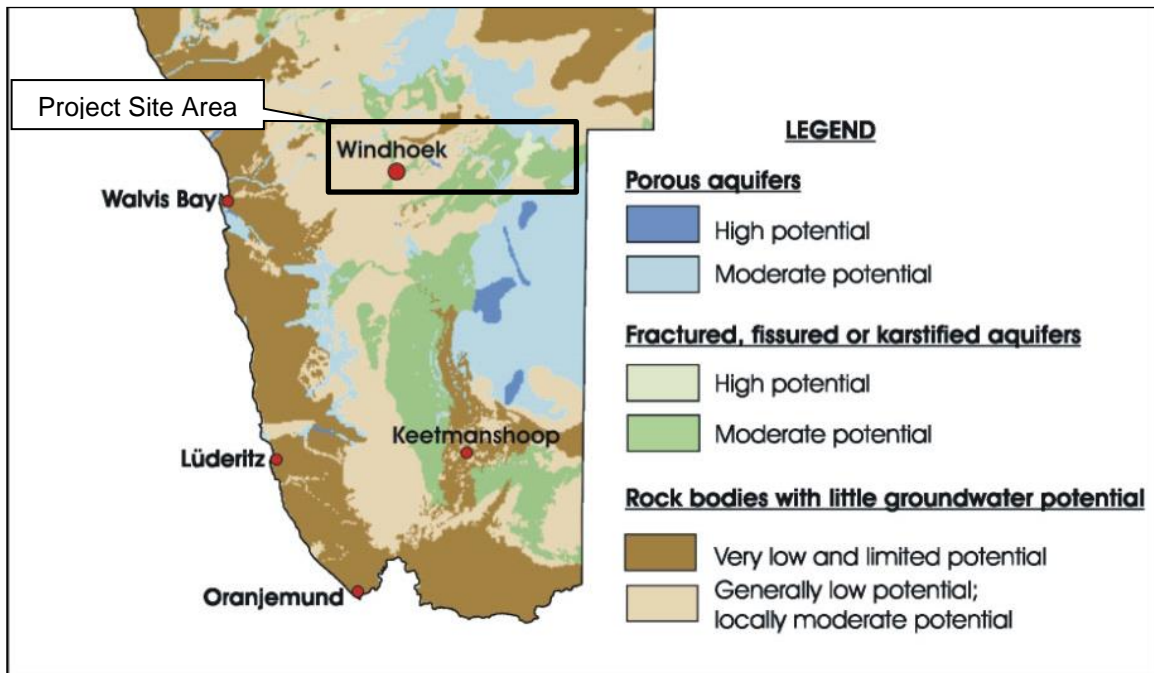


Figure 19: Hydrogeological Map of Namibia (Geological Survey of Namibia, 2015)

It can therefore be concluded that the geological and geohydrological settings: limit the flux of groundwater between different groundwater bodies or aquifers in the schist bedrock, thus limiting the movement of potential pollutants within this rock type; limit the probability that groundwater utilisation in one area will adversely affect groundwater availability in surrounding areas and could result in higher flux within homogenous layers (Geological Survey of Namibia, 2015).

10.4. SURFACE WATER

Surface water flow in a catchment is largely determined by rainfall (quantity and intensity), potential evapotranspiration and catchment relief. A drainage system comprises all the elements of the landscape through which or over which water travels within that drainage basin. These elements include the soil, vegetation growing on it, geological materials underlying the soil, stream channels carrying surface water and the zones where water is held in the soil and moves below the surface. It also includes constructed elements such as pipes and culverts, cleared and compacted land surfaces, and pavement and other impervious surfaces unable to absorb water. The hydrology of a region is thus characterised by the collection, movement and storage of water through a drainage basin.

Alteration of a natural drainage basin through for instance urbanisation can impose dramatic changes in the movement and storage of water. These changes can have negative impacts on other parties that use water for industrial, domestic and livestock watering purposes in the immediate vicinity or downstream.

10.5. BIODIVERSITY AND VEGETATION

The vegetation on Farm Excelsior where the sand mining operations will take place forms part of the Tree and Shrub Savannah Biome, specifically the Highland Savannah. The project site is showing evidence of some human inference namely informal tracks are present and vegetation was cleared on some areas of the site and a few gravel roads are present on the site.



Figure 20: Biomes of Namibia (Atlas of Namibia, 2002)

The general Windhoek area and surroundings (i.e. central Namibia) is regarded as “average to high” in overall (all terrestrial species) diversity while the overall terrestrial endemism is “high” (Mendelsohn *et al.* 2002). Central Namibia has between 161-200 endemic vertebrates (all vertebrates included). The overall diversity and abundance of large herbivorous mammals (big game) is viewed as “high” with 7-8 species while the overall diversity of large carnivorous mammals (large predators) is determined at 3 species with Leopard and Cheetah being the most important with “high” densities (Mendelsohn *et al.* 2002).

Mountainous and rocky features in the Highland Savannah are viewed as unique and often critical habitat to a variety of vertebrate fauna of concern – e.g. *Python anchietae* & Verreaux’s Eagle (“Near Threatened”). Such habitats should be protected, especially isolated patches thereof, as these often have an “island” effect with a variety of rock and crevasse dwelling species dependent on these areas.

Ephemeral drainage lines with associated riparian habitat, especially bigger trees, and temporary pools (and/or perennial springs and seeps) are also viewed as important habitat for a variety of vertebrate fauna – e.g. bark roosting bats; South African Gallago; cavity nesting birds (Monteiros & Damara Hornbills and Rüppells Parrot), etc. Important habitats for vertebrate fauna identified during the site visits are viewed as the rocky, mainly schist outcrops and few ephemeral drainage lines.

It is estimated that at least 78 reptiles, 9 amphibians, 81 mammal and 209 bird species (breeding residents) are known to or expected to occur in the general/immediate Farm Excelsior, Windhoek area of which a large proportion are endemics. Endemics include at

least 36% of the reptiles, 33% of the amphibians, 9.9% of the mammals and 71% (10 of the 14 Namibian endemics) of all the breeding and/or resident birds known and/or expected to occur in the general area. Although these endemics are known to occur in the general area, it is currently not clear if any of these are associated with the proposed operations area(s) or how exactly they will be affected by these operations.

The Highland Savannah, although varied, is classified by *Combretum apiculatum* subsp. *apiculatum* and *Acacia hereroensis*, *Acacia reficiens* and *Acacia erubescens* amongst others and the climax grasses on undisturbed areas dominated by *Antheophora pubescens*, *Brachiaria nigropedata* and *Digitaria eriantha* (Giess 1971). The best palatable grasses have often been denuded in the general area over time due to over- and selective grazing practices (Giess 1971). The overall vegetation structure can be classified as “dense shrubland” and “shrubs and low trees” (Mendelsohn *et al.* 2002).

According to Curtis and Mannheimer (2005) and Mannheimer and Curtis (2009) between 66 and 83 species of larger trees and shrubs are known and/or expected to occur in the general Windhoek area, respectively. Twenty-seven (32.5%) species of larger trees and shrubs have some kind of protected status in the general area. Five species (6.1%) are endemic, 3 species (3.7%) near-endemic, and 16 species (19.3%) protected by Forestry laws, 3 species (3.7%) protected by Nature Conservation laws.

During the site visit, various species of trees/shrubs were identified in the proposed project area. Of these, 6 species (*Acacia erioloba*, *Albizia anthelmintica*, *Boscia albitrunca*, *Ozoroa crassinervia*, *Searsia lancea* & *Ziziphus mucronata*) are protected under Forestry legislation with 1 species also being “near-endemic” (*Ozoroa crassinervia*).

The most important tree/shrub species expected from the general area are the various protected species and species of conservation concern and include *Commiphora dinteri* (endemic), *Cyphostemma bainesii* (endemic, NC), *Cyphostemma currorii* (NC) and *Heteromorpha papillosa* (endemic). All aloe species are protected in Namibia and other species potentially occurring in the general area are *Aloe hereroensis* and *Aloe zebrina* (Rothmann 2004). None of the species are exclusively associated with the project area.

Up to 101 grasses are expected in the general Windhoek area of which 4 species are viewed as endemic (*Eragrostis omahekensis*, *Eragrostis scopelophila*, *Pennisetum foermeranum* and *Setaria finite*). *Pennisetum foermeranum* is associated with rocky mountainous terrain and consequently only expected in such suitable habitat. *Eragrostis omahekensis* is virtually only found on disturbed soils – e.g. close to watering points – while *Eragrostis scopelophila* is associated with mountainous areas under trees and shrubs. The endemic *Setaria finite* is associated with drainage lines in the general area; never very common and probably the grass species most likely to be affected most by operations in the area. None of the species are exclusively associated with the project area. The dominant grass throughout the proposed project area was *Brachiaria nigropedata*.



Figure 21: Grass present on site currently



Figure 22: No trees were damaged in the mining process

The natural characteristics of the project site namely the vegetation clearance and the destruction of habitats is expected to further on have a low impact on the environment before the mitigation measures are taken and after the mitigation measures are taken, the impact will be very low. It is expected that once these areas are rehabilitated after mining that the natural vegetation will recover to its original state.

CONCLUSION AND IMPACT

The sand mining activities will have a medium impact on vegetation, shrubs and trees.

10.6. SOCIAL-ECONOMIC COMPONENT

The proposed sand mining activities will have / is having a positive impact on the socio-economic environment because of employment creation. Apart from the proponent's intention to make a profit out of the proposed activities, advantages to the area are numerous. The proposed operations will create the need for more business activities such as medical care, building maintenance, vehicle maintenance, electrical and additional support for schools and other existing businesses etc. At the moment a limited amount of dust and noise are being produced on the site.

The proposed project creates semi-permanent employment. The operations will give the area a much-needed economic injection which will have a multiplier effect in the community regarding sales and services. Services that will benefit from the sand mining operations are amongst other shops, doctors, garages, etc. The operations will also bring in investments and buying power.

Although the Council will be faced with more demands for services, the revenue from rates and taxes would possibly be sufficient for the Council to become self-sufficient and less of a burden on Government. Since the majority of land use in and around the area is characterised by open or farmland, residential and commercial/business related activities, the operations will not have a negative impact on the neighbours or the surrounding areas.

CONCLUSION AND IMPACT

The sand mining activities will have a positive impact on the community since employment is created and sand is provided.

10.7. CULTURAL HERITAGE

The proposed project site is not known to have any historical significance prior to or after Independence in 1990. The specific area does not have any National Monuments and the specific site has no record of any cultural or historical importance or on-site resemblance of any nature. No graveyard or related article was found in the area. However, the Namibian National Heritage Act (No. 27 of 2004) provides for the protection and conservation of places and objects of heritage significance and the registration of such places and objects and to provide for incidental matters.

CONCLUSION AND IMPACT

No heritage resources or graveyards were observed on the site or in the area.

10.8. SENSE OF PLACE

The proposed sand mining activities does not have a large/negative impact on the sense of place in the area. An untidy or badly managed site can detract from the ecological well-being and individuality of the area. Unnecessary disturbance to the surroundings could

be caused by poorly planned or poorly managed operational activities. The project site should be kept neat and clean where possible. Vegetation should not be removed or harmed if not necessary since it covers topsoil which prevents erosion. Noise and dust should be limited because of the neighbouring activities.



Figure 23: Sense of place

CONCLUSION AND IMPACT

The impact on the sense of place will be low.

10.9. HEALTH

The safety, security and health of the labour force, employees and neighbours are of great importance, workers should be orientated with the maintenance of safety and health procedures and they should be provided with PPE (Personal Protective Equipment). A health and safety officer should be employed to manage, coordinate and monitor risk and hazard and report all health and safety related issues in the workplace. The introduction of external workers into the area is sometimes accompanied with criminal activities posing security risks for neighbours. However, the proponent will take certain measures to prevent any activity of this sort. The welfare and quality of life of the neighbours and workforce needs to be considered for the project to be a success on its environmental performance. Conversely, the process should not affect the overall health of persons related to the project including the neighbours.

CONCLUSION AND IMPACT

The proposed sand mining activities will have a low impact on the health of the affected community.

11. INCOMPLETE OR UNAVAILABLE INFORMATION

The number of people that will be employed on the site will depend on the type and scope of the activities.

12. IMPACT ASSESSMENT AND EVALUATION

The Environmental Impact Assessment sets out potential positive and negative environmental impacts associated with the project site. The following assessment methodology will be used to examine each impact identified, see *Table* below:

Table 2: Impact Evaluation Criterion (DEAT 2006)

Criteria	Rating (Severity)	
Impact Type	+	Positive
	O	No Impact
	-	Negative
Significance of impact being either	L	Low (Little or no impact)
	M	Medium (Manageable impacts)
	H	High (Adverse impact)

Probability:	Duration:
5 – Definite/do not know	5 - Permanent
4 – Highly probable	4 – Long-term (impact ceases)
3 – Medium probability	3 – Medium term (5 – 15 years)
2 – Low probability	2 – Short-term (0 – 5 years)
1 – Improbable	1 - Immediate
0 - None	
Scale:	Magnitude:
5 – International	10 – Very high/do not know
4 – National	8 - High
3 – Regional	6 - Moderate
2 – Local	4 - Low
1 – Site only	2 - Minor
	0 - None

The impacts on the receiving environment are discussed in the paragraphs below:

12.1. IMPACTS DURING THE OPERATIONAL PHASE

12.1.1. ECOLOGICAL IMPACTS

Staff, workers and visitors should only make use of walkways and existing roads to minimise the impact on vegetation. Minimise the area of disturbance by restricting movement to the designated working areas during maintenance.

Impact Evaluation

Aspect	Impact Type	Scale	Duration	Magnitude	Probability	Significance	
						Unmitigated	Mitigated
Ecology Impacts	-	2	2	4	2	M	L

12.1.2. DUST POLLUTION AND AIR QUALITY

Vehicles transporting goods and staff will contribute to the release of hydrocarbon vapours, carbon monoxide and sulphur oxides into the air. Possible release of sewer odour, due to sewer system failure or maintenance might also occur. All maintenance of bulk services and infrastructure at the project site has to be designed to enable environmental protection.

Impact Evaluation

Aspect	Impact Type	Scale	Duration	Magnitude	Probability	Significance	
						Unmitigated	Mitigated
Dust & Air Quality	-	2	2	4	3	M	L

12.1.3. CONTAMINATION OF GROUNDWATER

Spillages might also occur during maintenance. This could have impacts on groundwater especially in cases of large sewer spills. Proper containment should be used in cases of sewerage system maintenance. Oil and chemical spillages may have a health impact on groundwater users. Potential impact on the natural environment from possible polluted groundwater also exists.

Impact Evaluation

Aspect	Impact Type	Scale	Duration	Magnitude	Probability	Significance	
						Unmitigated	Mitigated
Groundwater contamination	-	2	2	4	2	M	L

12.1.4. GENERATION OF WASTE

Household waste from the activities at the site and from the staff working at the site will be generated. The waste will be collected, sorted to be recycled and stored in on site for transportation and disposal at an approved landfill site.

Impact Evaluation

Aspect	Impact Type	Scale	Duration	Magnitude	Probability	Significance	
						Unmitigated	Mitigated
Waste Generation	-	1	2	2	2	M	L

12.1.5. FAILURE IN RETICULATION PIPELINES

There may be a potential release of sewage, stormwater or water into the environment due to pipeline/system failure. As a result, the spillage could be released into the environment and could potentially be a health hazard to surface and groundwater. Proper reticulation pipelines and drainage systems should be installed. Regular bulk services infrastructure and system inspection should be conducted.

Impact Evaluation

Aspect	Impact Type	Scale	Duration	Magnitude	Probability	Significance	
						Unmitigated	Mitigated
Failure of Reticulation Pipeline	-	2	2	4	2	L	L

12.1.6. FIRES AND EXPLOSIONS

Food is prepared on gas fired stoves. There should be sufficient water available for firefighting purposes. Ensure that all fire-fighting devices are in good working order and are serviced. All personnel have to be trained about responsible fire protection measures and good housekeeping such as the removal of flammable materials on site. Regular inspections should be carried out to inspect and test firefighting equipment by the contractor.

Impact Evaluation

Aspect	Impact Type	Scale	Duration	Magnitude	Probability	Significance	
						Unmitigated	Mitigated
Fires and Explosions	-	2	2	4	2	M	L

12.1.7. HEALTH, SAFETY AND SECURITY

The safety, security and health of the labour force, employees and neighbours are of great importance, workers should be orientated with the maintenance of safety and health procedures and they should be provided with PPE (Personal Protective Equipment). No open flames, smoking or any potential sources of ignition should be allowed at the project location. Signs such as 'NO SMOKING' must be prominently displayed in parts where inflammable materials are stored on the premises.

Impact Evaluation

Aspect	Impact Type	Scale	Duration	Magnitude	Probability	Significance	
						Unmitigated	Mitigated
Safety & Security	-	1	2	4	2	L	L

12.2.CUMULATIVE IMPACTS

These are impacts on the environment, which results from the incremental impacts when added to other past, present, and reasonably foreseeable future actions regardless of which person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time. In relation to an activity, it means the impact of an activity that in it may not become significant when added to the existing and potential impacts resulting from similar or diverse activities or undertakings in the area.

Possible cumulative impacts associated with the proposed project include sewer damages/maintenance, uncontrolled traffic and destruction of the vegetation or the environment. These impacts could become significant especially if it is not properly supervised and controlled. This could collectively impact on the environmental conditions in the area.

Impact Evaluation

Aspect	Impact Type	Scale	Duration	Magnitude	Probability	Significance	
						Unmitigated	Mitigated
Cumulative Impacts	-	2	3	4	2	L	L

13. CONCLUSION

In line with the Environmental Management Act (No 7 of 2007), *Green Earth Environmental Consultants* have been appointed to conduct an Environmental Impact Assessment Renewal for the sand and aggregate mining operations in the Seëis River on the Remainder of Farm Excelsior No. 286, Windhoek, Khomas Region. It is believed that the proposed sand mining activities can largely benefit the employment and economical needs of the area.

The negative environmental impacts that may be visible in the operational phase of the project include: increases in solid waste generation for example food and plastics, etc., increased stress on waste disposal facilities, increase in water consumption and waste water generation, can result in an increase in traffic on the nearby roads and there can be an impact on the occupational health and safety of workers. However, this project is believed to be an asset to this area. Employment and products (sand and aggregate) will be made available for which there is a need.

After assessing all information available on this project, *Green Earth Environmental Consultants* believe that the sand mining activities will not have a large negative effect on the environment if operations are conducted in accordance with the Environmental Management Plan.

14. RECOMMENDATION

It is therefore recommended that the Ministry of Environment, Forestry and Tourism through the Environmental Commissioner support and approve the Environmental Clearance Renewal for the sand and aggregate mining operations in the Seëis River on the Remainder of Farm Excelsior No. 286, Windhoek, Khomas Region and for the following listed activities:

MINING AND QUARRYING ACTIVITIES

- *The construction of facilities for any process or activities which requires a licence, right or other form of authorisation, and the renewal of a licence, right or other form of authorisation, in terms of the Minerals (Prospecting and Mining Act), 1992.*
- *Other forms of mining or extraction of any natural resources whether regulated by law or not.*
- *Resource extraction, manipulation, conservation and related activities.*

LIST OF REFERENCES

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Mannheimer, C. & Curtis, B. 2009. *Le Roux and Muller's Guide to the Trees & Shrubs of Namibia*. Windhoek: Macmillan Education Namibia, pp. 249 – 439.

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Water Resource Management Act, 2004. *Office of the Prime Minister*. Windhoek. Namibia, pp. 6 – 67.

APPENDIX A: CURRICULUM VITAE OF CHARLIE DU TOIT

1. **Position:** Environmental Practitioner
2. **Name/Surname:** Charl du Toit
3. **Date of Birth:** 29 October 1960
4. **Nationality:** Namibian

5. **Education:**

Name of Institution	University of Stellenbosch, South Africa		
Degree/Qualification	Hons B (B + A) in Business Administration and Management		
Date Obtained	1985-1987		
Name of Institution	University of Stellenbosch, South Africa		
Degree/Qualification	BSc Agric Hons (Chemistry, Agronomy and Soil Science)		
Date Obtained	1979-1982		
Name of Institution	Boland Agricultural High School, Paarl, South Africa		
Degree/Qualification	Grade 12		
Date Obtained	1974-1978		

6. **Membership of Professional Association:** EAPAN Member (Membership Number: 112)

7. **Languages:**

	<u>Speaking</u>	<u>Reading</u>	<u>Writing</u>
English	Good	Good	Good
Afrikaans	Good	Good	Good

8. **Employment Record:**

<u>From</u>	<u>To</u>	<u>Employer</u>	<u>Position(s) held</u>
2009	Present	Green Earth Environmental Consultants	Environmental Practitioner
2005	2008	Elmarie Du Toit Town Planning Consultants	Manager
2003	2005	Pupkewitz Megabuild	General Manager
1995	2003	Agra Cooperative Limited	Manager Trade
1989	1995		Chief Agricultural Consultant

		Namibia	
		Development	Agricultural
1985	1988	Corporation	Researcher
		Ministry of	
		Agriculture	

Certification:

I, the undersigned, certify that to the best of my knowledge and belief, this CV correctly describes myself, my qualifications, and my experience. I understand that any wilful misstatement described herein may lead to my disqualification or dismissal, if engaged.



Charl du Toit

APPENDIX B: CURRICULUM VITAE OF CARIEN VAN DER WALT

1. **Position:** Environmental Consultant
2. **Name/Surname:** Carien van der Walt
3. **Date of Birth:** 6 August 1990
4. **Nationality:** Namibian

5. **Education:**

Institution	Degree/Diploma	Years
University of Stellenbosch	B.A. (Degree) Environment and Development	2009 to 2011
University of South Africa	B.A. (Honours) Environmental Management	2012 to 2013

6. **Membership of Professional Associations:**

EAPAN Member (Membership Number: 113)

7. **Languages:**

Language	Speaking	Reading	Writing
English	Good	Good	Good
Afrikaans	Good	Good	Good

8. **Employment Record:**

From	To	Employer	Positions Held
07/2013	Present	Green Earth Environmental Consultants	Environmental Consultant
06/2012	03/2013	Enviro Management Consultants Namibia	Environmental Consultant
12/2011	05/2012	Green Earth Environmental Consultants	Environmental Consultant

9. **Detailed Tasks Assigned:**

Conducting the Environmental Impact Assessment, Environmental Management Plan, Public Participation, Environmental Compliance and Environmental Control Officer

Certification:

I, the undersigned, certify that to the best of my knowledge and belief, this CV correctly describes myself, my qualifications, and my experience. I understand that any wilful misstatement described herein may lead to my disqualification or dismissal, if engage.

Carien van der Walt

APPENDIX C: ENVIRONMENTAL MANAGEMENT PLAN